

REMARKS/ARGUMENTS

Claims pending in the instant application are numbered 1-19. Claims 1-19 presently stand rejected. Claims 1, 5, 8, 12 and 15 are amended herein. The Applicant respectfully requests that the instant application be reconsidered in view of the following remarks.

35 U.S.C. § 103 Rejections

In the March 8, 2007 Office Action, claims 1-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Tan et al. (US Patent 6,043,481) in view of various combinations of Assadi et al. (US Patent 6,166,369), Applicant's own disclosure, and Nakai (US Patent 5,396,090).

With regard to a rejection under 35 U.S.C. § 103, MPEP § 2143.03 sets forth that

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.

In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Amended claim 1 recites:

1. An image sensor comprising:
a plurality of pixels formed in a semiconductor substrate, each pixel including a light sensitive element;
a micro-lens over each of said light sensitive elements; and
a raised ridge structure surrounding each of said micro-lenses, wherein said raised ridge structure has a triangular cross-section and at least partially supports said micro-lens, **wherein the micro-lens overlays a base portion of the raised ridge structure.**

Thus, independent claim 1 recites a micro-lens that **overlays a base portion** of a raised ridge structure that has a triangular cross-section. Applicant respectfully submits that the cited

references fail to disclose, teach or even fairly suggest this expressly recited element, as is more fully explained below.

In the March 8, 2007 Office Action, the Examiner acknowledges that Tan fails to teach a raised ridge structure with a *triangular* cross-section and instead, only teaches a raised ridge structure with a *rectangular* cross-section. Office Action, mailed 3/8/07, page 2. However, the Examiner continues the rejection by referring to the reflective surfaces 12 of Assadi to allegedly show this element. Regardless of whether Assadi teaches what is asserted by the Examiner, neither Tan, nor Assadi when taken singularly or in combination disclose, teach or suggest the micro-lens as overlaying a base portion of the raised ridge structure, as claimed by Applicant.

For example, Tan discloses a contoured surface 10 that defines a ridged pattern exhibiting raised portions 19 and depressed portions 20 of the contoured surface 10. Tan, col. 3, lines 42-45. However, FIGS. 4 and 9B, of Tan clearly show convex surface elements 18A (referred to in some FIGS as 18) as only disposed over depressed portions 20, **not** over raised portions 19 of contoured surface 10. **Since, Tan discloses convex surface elements 18A as only disposed over depressed portions 20, it necessarily fails to disclose a micro-lens overlaying a base portion of a raised ridge structure, as claimed by Applicant.**

Assadi fails to cure the deficiencies of Tan. For example, FIG. 3 of Assadi clearly shows microlens 24 as formed between reflective surface 12 and over substrate 14. **Assadi fails to disclose microlens 24 as overlaying any portion of reflective surface 12.**

Nakai does not cure the deficiencies of Tan and Assadi. Thus, the cited references fail to disclose each and every element of claim 1, as required under M.P.E.P. §2143.03. Independent claims 8 and 15 include similar nonobvious elements as independent claim 1. Accordingly, Applicants respectfully request that the §103(a) rejections of claims 1, 8 and 15 be withdrawn.

Furthermore, independent claim 8 has been amended to further recite, "...isotropically etching the top planarizing layer..." As discussed in Applicant's specification, isotropic etching includes etching in both the x and y directions. Specification, [0024]. Applicant further discloses that isotropically etching the top planarizing layer 403 with photoresist ridges 405 results in triangular ridges 601 being formed. Id. None of the cited references disclose, teach, or suggest this expressly recited process. For example, as mentioned above, Assadi discloses a reflective surface 12 that includes a triangular cross-section. However, Assadi discloses that the triangular shapes of reflective surfaces 12 are formed using a **photolithographic** technique that includes using glass mask 26 and over-exposing region 30 to ultraviolet light. Assadi, col. 3 lines 25-36 and FIG. 4. **Since Assadi discloses forming reflective surfaces 12 through photolithography, it necessarily fails to disclose isotropically etching a top planarizing layer, as expressly claimed by Applicants.**

The dependent claims are nonobvious over the cited references for at least the same reasons as discussed above in connection with their respective independent claims, in addition to adding further limitations of their own. Accordingly, Applicants respectfully request that the instant § 103 rejections of the dependent claims also be withdrawn.

CONCLUSION

In view of the foregoing amendments and remarks, Applicant believes the applicable rejections have been overcome and all claims remaining in the application are presently in condition for allowance. Accordingly, favorable consideration and a Notice of Allowance are earnestly solicited. The Examiner is invited to telephone the undersigned representative at (206) 292-8600 if the Examiner believes that an interview might be useful for any reason.

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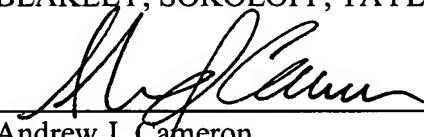
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The Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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Date: 6-14-07


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